Amebiasis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Entamoeba histolytica is a protozoan parasite which should not be confused with *Entamoeba hartmanni*, *Entamoeba coli* or other intestinal protozoa which do not cause amebiasis. The trophozoite is the metabolically active form (which causes symptoms), but it is not as infectious as the cyst form because it cannot survive in the environment or transit through the acidic stomach. Under some conditions, environmentally resistant cysts form in the lower intestine and these are infectious. Thus, infected persons can shed both trophozoites and cysts in stool.

B. Clinical Description

Infections can be intestinal, extraintestinal or both. Most cases are intestinal and are asymptomatic. Symptoms are multiple and varied, ranging from mild abdominal discomfort and diarrhea (often with blood and mucus) alternating with periods of remission or constipation, to severe illness with fever, chills, and significant bloody or mucoid diarrhea ("amebic dysentery"). Amebic colitis may be confused with inflammatory bowel disease, such as ulcerative colitis.

C. Reservoirs

Humans, primarily chronic or asymptomatic carriers, are reservoirs for amebiasis.

D. Modes of Transmission

This parasite is transmitted fecal-orally by ingestion of cysts. This can happen via contaminated food or water or through person-to-person spread, particularly among preschool children, within households and through certain types of sexual contact (*e.g.*, oral-anal contact).

E. Incubation Period

The incubation period is commonly from 2 to 4 weeks, but it can vary from a few days to several months or years.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *E. histolytica* cysts, which can go on for years. Asymptomatically infected persons tend to excrete a much higher proportion of cysts and, hence, are more likely to transmit infection than persons who are acutely ill, who tend to excrete trophozoites.

G. Epidemiology

Amebiasis has a worldwide distribution but is typically rare in children under the age of five. Prevalence is higher in areas with poor sanitation (such as parts of the tropics), in institutions for the developmentally disabled and among men who have sex with men. The estimated prevalence in the United States is 4%.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. What to Report to the Massachusetts Department of Public Health

Report any of the following:

- Demonstrations of cyst or trophozoites of *E. histolytica* in stool, or
- Demonstration of trophozoites of *E. histolytica* in extraintestinal tissue, tissue biopsy or ulcer scrapings (by culture or histopathology), or
- Demonstration of specific antibody against *E. histolytica* as measured by indirect hemagglutination or another reliable immunodiagnostic test (*e.g.,* enzyme-linked immunosorbent assay).

Note: See Section 3) C below for information on how to report a case.

B. Laboratory Testing Services Available

The State Laboratory Institute (SLI) does not provide ova and parasite testing for clinical or food items. Arrangements can be made through the SLI, Reference Laboratory for serum to be sent to the Centers for Disease Control and Prevention (CDC) for antibody testing. Contact the Reference Laboratory at (617) 983-6607 for more information.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.,* a diapered child, daycare attendee or foodhandler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.,* a contaminated public water supply) and to stop transmission from such a source.

B. Laboratory and Healthcare Provider Reporting Requirements

Please refer to the lists of reportable diseases (at the end of this manual's introductory section) for specific information.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. **Reporting Requirements**

Massachusetts Department of Public Health (MDPH) regulations (*105 CMR 300.000*) stipulate that each local board of health (LBOH) must report the occurrence of any case of amebiasis, as defined by the reporting criteria in Section 2) A above. Current requirements are that cases be reported to the MDPH Division of Epidemiology and Immunization, Surveillance Program using an official MDPH *Bacterial and Parasitic Gastroenteritis Case Report Form* (see copy in Appendix A). Please refer to the *Local Board of Health Reporting Timeline* (provided at the end of this manual's introductory section) for information on prioritization and timeliness requirements of reporting and case investigation.

2. **Case Investigation**

a. It is the LBOH responsibility to complete a *Bacterial and Parasitic Gastroenteritis Case Report Form* by interviewing the case and others who may be able to provide pertinent information (see copy in Appendix A). Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines to assist you in completing the form:
   1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
   2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for amebiasis (2–4 weeks). Specifically, focus on the period beginning a minimum of 2 weeks prior to the case's onset date back to no more than 4 weeks before onset.
   3) If possible, record any restaurants at which the case ate, including food item(s) and date consumed. If you suspect that the case became infected through food, use of the MDPH *Foodborne Illness*

Complaint Worksheet (in Appendix A) will facilitate recording additional information. It is requested that LBOHs fax or mail this worksheet to the MDPH Division of Food and Drugs (see top of worksheet for fax number and address). This information is entered into a database to help link other complaints from neighboring towns, thus helping to identify foodborne illness outbreaks. *This worksheet does not replace the Bacterial and Parasitic Gastroenteritis Case Report Form.*

4) Ask about travel history and outdoor activities to help identify where the case became infected.
5) Ask about water sources because amebiasis may be acquired through water consumption.
6) Household/close contact, pet or other animal contact, daycare, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a daycare facility and/or is a food handler.
7) If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the case report form with as much information as you have gathered. Please note on the form the reason why it could not be filled out completely.

c. After completing the case report form, attach lab report(s) and mail (in an envelope marked "Confidential") to the MDPH Division of Epidemiology and Immunization, Surveillance Program. The mailing address is:

MDPH, Division of Epidemiology and Immunization
Surveillance Program, Room 241
305 South Street
Jamaica Plain, MA 02130

d. Institution of disease control measures is an integral part of case investigation. It is the LBOH responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4), Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*105 CMR 300.200*)

Foodhandlers with amebiasis must be excluded from work. *Note:* A case of amebiasis is defined by the reporting criteria in Section 2) A of this chapter.

Minimum Period of Isolation of Patient

After diarrhea has resolved, foodhandling facility employees may only return to work after producing one negative stool specimen. If a case has been treated with an antimicrobial, the stool specimen shall not be submitted until at least 48 hours after cessation of therapy. In outbreak circumstances, a second consecutive negative stool specimen will be required prior to returning to work.

Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are foodhandling facility employees shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A foodhandler is any person directly preparing or handling food. This can include a patient care or child care provider. See glossary for a more complete definition.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since amebiasis may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on cases of amebiasis in a daycare setting carefully. The MDPH *Health and Safety in Child Care* provides detailed information on case follow-up and control in a daycare setting. General recommendations include:

- Children with amebiasis who have diarrhea should be excluded until their diarrhea is gone.
- Children with amebiasis who have no diarrhea and who are otherwise not ill may be excluded or may remain in the program if special precautions are taken.
- Since most staff in child care programs are considered foodhandlers, those with *E. histolytica* in their stools (symptomatic or not) can remain on site, but must not prepare food or feed children until their diarrhea is gone and they have one negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). (Per *105 CMR 300.200*)
- Refer to Chapter 17 of the MDPH *Health and Safety in Child Care* for complete guidelines on handling diseases spread through the intestinal tract.

School

Since amebiasis may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on cases of amebiasis in a school setting carefully. The MDPH *Comprehensive School Health Manual* provides detailed information on case follow-up and control in a school setting. General recommendations include:

- Students or staff with amebiasis who have diarrhea should be excluded until their diarrhea is gone.
- Students or staff who do not handle food but have amebiasis with no diarrhea or mild diarrhea and are not otherwise sick, may remain in school if special precautions are taken.
- Students or staff who handle food and have *E. histolytica* infection (symptomatic or not) must not prepare food until their diarrhea is gone and they have one negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). (Per *105 CMR 300.200*)
- Refer to Chapter 8 of the MDPH *Comprehensive School Health Manual* for complete guidelines on handling diseases spread through the intestinal tract.

Community Residential Programs

Actions taken in response to a case of amebiasis in a community residential program will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with *E. histolytica* should be placed on standard (including enteric) precautions until their symptoms subside *and* they have a negative stool culture for *E. histolytica.* (Refer to the Division of Epidemiology and Immunization's *Control Guidelines for Long-Term Care Facilities* for further actions. A copy can be obtained by calling the Division at (617) 983-6800 or (888) 658-2850.) Staff members with *E. histolytica* infection who give direct patient care (e.g., feed patients, give mouth or denture care or give medications) are considered foodhandlers and are subject to foodhandler restrictions under *105 CMR 300.200.* See Section 4) A above. In addition, staff members with *E. histolytica* infection who are not considered foodhandlers should not work until their diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with amebiasis must refrain from handling or preparing food for other residents until their diarrhea has subsided and they have one negative stool test for *E. histolytica* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are

given). (Per *105 CMR 300.200)* In addition, staff members with *E. histolytica* infection who are not foodhandlers should not work until their diarrhea is gone.

Reported Incidence Is Higher than Usual/Outbreak Suspected
If the number of reported cases of amebiasis in your city/town is higher than usual, or if you suspect an outbreak, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food or association with a daycare center) should be sought and applicable preventive or control measures should be instituted (*e.g.*, removing implicated food items from the environment). Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. The Division can help determine a course of action to prevent further cases and can perform surveillance for cases across town lines and therefore be difficult to identify at a local level.

Note: Refer to the MDPH's *Foodborne Illness Investigation and Control Reference Manual* for comprehensive information in investigating foodborne illness complaints and outbreaks. (Copies of this manual were distributed to local boards of health in 1997–98. It can also be located on the MDPH website in PDF format at <http://www.magnet.state.ma.us/dph/fpp/refman.htm>.) For recent changes (fall 2000) to the Massachusetts Food Code, contact the Division of Food and Drugs, Food Protection Program at (617) 983-6712 or through the MDPH website at <http://www.state.ma.us/dph/fpp/>.

D. Preventive Measures

Personal Preventive Measures/Education
To prevent future exposures, recommend that individuals:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- After changing diapers, wash the child's hands as well as their own.
- In a daycare setting, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea, scrub their hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes or soiled sheets. Wash their hands properly with plenty of soap and water, especially before handling food, before eating and after toilet use.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of amebiasis to a case's sexual partners as well as being a way to prevent exposure to and transmission of other pathogens.

International Travel
Travelers to developing countries should:

- Drink only bottled water, carbonated water, canned or bottled sodas. Boiling water for one minute will kill parasites, bacteria, or viruses that may be present including *E. histolytica.* However, *E. histolytica* is not killed by low doses of chlorine or iodine; do not rely on chemical water purification tablets (such as halide tablets) to prevent amebiasis.
- Cook food thoroughly to kill parasites, bacteria, or viruses that may be present. If you plan to eat raw vegetables that may be contaminated, they should first be washed with a strong detergent soap.
- Do not eat fruit that already has been peeled or cut.
- Drink only pasteurized milk or dairy products. Avoid eating unpasteurized dairy products or drinking raw milk. They can be contaminated with unclean water.

Note: For more information regarding international travel and amebiasis, contact the CDC's Traveler's Health Office at (877) 394-8747 or through the internet at <http://www.cdc.gov/travel>.

ADDITIONAL INFORMATION

The following is the formal CDC surveillance case definition for amebiasis. It is provided for your information only and should not affect the investigation or reporting of a case that fulfills the criteria in Section 2) A of this chapter. (CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting.) For reporting to the MDPH always use the criteria outlined in Section 2) A.

Clinical description
Infection of the large intestine by *Entamoeba histolytica* may result in an illness of variable severity ranging from mild, chronic diarrhea to fulminant dysentery. Infection also may be asymptomatic. Extraintestinal infection also can occur (*e.g.,* hepatic abscess).

Laboratory criteria for diagnosis
Intestinal amebiasis
- Demonstration of cysts or trophozoites of *E. histolytica* in stool, or
- Demonstration of trophozoites in tissue biopsy or ulcer scrapings by culture or histopathology.

Extraintestinal amebiasis
- Demonstration of *E. histolytica* trophozoites in extraintestinal tissue.

Case classification
Confirmed, intestinal amebiasis: a clinically compatible illness that is laboratory confirmed.

Confirmed, extraintestinal amebiasis: a parasitologically confirmed infection of extraintestinal tissue, or among symptomatic persons (with clinical or radiographic findings consistent with extraintestinal infection), demonstration of specific antibody against *E. histolytica* as measured by indirect hemagglutination or other reliable immunodiagnostic test (*e.g.,* enzyme-linked immunosorbent assay).

REFERENCES

American Academy of Pediatrics. *1997 Red Book: Report of the Committee on Infectious Diseases, 24th Edition.* Illinois, Academy of Pediatrics, 1997.

CDC. Case Definitions for Infectious Conditions Under Public Health Surveillance. *MMWR.* May 2, 1997; 46:RR-10.

CDC Website. Amebiasis Infection. Available at <www.cdc.gov/ncidod/dpd/parasites/amebiasis/factsht_amebiasis.htm>. Updated June 15, 1999.

Chin, J., ed. *Control of Communicable Diseases Manual, 17th Edition*. Washington, DC, American Public Health Association, 2000.

MDPH. *The Comprehensive School Health Manual*. MDPH, January 1995.

MDPH. *Health & Safety in Child Care: A Guide for Child Care Providers in Massachusetts.* MDPH, 1995.

MDPH. *Regulation 105 CMR 300.000: Reportable Diseases and Isolation and Quarantine Requirements*. MDPH, Promulgated November 1998 (Printed July 1999).

Oregon Health Division. *Investigative Guidelines: Amebiasis*. Oregon Health Division, December 1994.